Science and Psychic Behaviour.

The British Journal of Psychical Research. Vol. I. No. 5. Jan.-Feb. (London: National Laboratory of Psychical Research, 1927.) 1*s*.

THE accusation is frequently levelled at scientific workers that they will give no thought or credence to the very real phenomena of the supernormal, and that this attitude of aloofness sits ill on those who profess the true scientific spirit. That there is truth in the charge can scarcely be gainsaid. When Sir Oliver Lodge pronounces on a modern development or even a modern speculation of molecular physics, the auditorium is filled with craning necks and assenting minds, but let him turn to the subject of materialisations or the after-life, the scientific necks are relaxed and the minds closed. It is worth while inquiring why this conspiracy of hostile silence is maintained.

It is a truism that trustworthy scientific work can be accomplished only by trained minds after elaborate preparation for a line of attack based on a close study of the problem. For in all circumstances the question at stake is the question of what is and what is not admissible evidence. The scientific process is the method of collecting and assembling that evidence, and no deduction will stand that allows of possible ambiguity or for which the evidence is not both necessary and sufficient. Even legal standards are not permissible. The final conclusion cannot be based on circumstantial evidence, nor does one give an electron the benefit of the doubt. The logic of the law court is not necessarily the logic of the laboratory.

In these circumstances it is permissible to doubt that any individual, no matter how well intentioned, could sail into a notoriously difficult region of inquiry and produce almost immediately astounding results of full evidential value. Even were the individual a trained scientific investigator, there is a natural hesitancy in acceptance, for independent verification by other workers is a necessary and legitimate demand. The difficulty is accentuated when the scientist who undertakes or is present at the inquiry is constrained to work under conditions and limitations the full implications of which cannot be precisely appreciated. The phenomenon, he may be told, will take place only in darkness, or in dull red light, or in the presence of a particular individual or a group of individuals, or when a gramophone plays in the subdued light of a vacuum tube discharge, and so on. If, moreover, the events described as occurring, when accepted, would involve a complete reconsideration of the structure of mechanical processes, reluctance to admit that the evidence is above criticism is naturally intensified.

These are the difficulties one encounters with most of the material in the publication before us. If the merest fraction of the evidence adduced in this small volume were to be admitted it would cause a revolution in scientific thought. In a lecture delivered at the National Laboratory of Psychical Research, Countess Wassilko-Serecki describes the history—one is almost tempted to write the hysteria—and phenomenon of Eleonore Zügun, a Rumanian peasant girl. In the presence of this girl inanimate objects become endowed with a will of their own, bricks fly about, dishes dash themselves to pieces, a stone jumps out of the river, is replaced and jumps out again, scratches and bites appear on her arm, cups are snatched from her hand by invisible powers, and so on. A great deal of the evidence for this is not direct but produced by the Countess from depositions of individuals abroad. Dr. R. J. Tillyard contributes a record of two séances conducted by a medium in Boston, Mass. Here darkness appears to be essential, and the medium goes into a trance. This is verified at intervals by red light. It would be interesting to have details of the verification of this trance condition conducted in such difficult circumstances, but they are not provided. A gramophone plays a negro melody and a voice—immediately referred to as 'Walter's' voice—talks "freely and wittily" apparently from inside a cabinet. The humour does not, however, appear to be very deep. A flower basket—rendered luminous—moves about high up in the room, rocked by 'Walter,' we are told, but no evidence is adduced about 'Walter' beyond the voice, or as to whether the basket was actually rocked by him.

Much could be said about this kind of science, but restraint is desirable. Numerous questions naturally suggest themselves. If a brick can fling itself through a window, what reliance can be placed on the prediction of the total eclipse in June? What reliance can be placed on the performance of *any* machine? Alternatively, if, as experience shows, full reliance can be placed on a multitude of such predictions, what reliance can be placed on the evidence about the brick? Scepticism becomes charity indeed. There is here a frank conflict of evidence, and until it is resolved the scientist's natural inclination is to turn back to the restful haven of verified knowledge. If there are inconsistencies in his own field, if for the moment he cannot reconcile solar mechanics with

the mechanics of the electron, his past experience has at least taught him that with patience these troubles will be smoothed. Consistency of behaviour of his material, however, is implicit in his method of approach. Such an assumption may possibly prove to be ill-founded, and the self-propulsion of the brick through the window, referred to above, may ultimately prove to be the actual disturber of his mental peace. But his *malaise* in the presence of such a phenomenon—if true—goes deeper than this. "If the material with which I have to deal," he says, "is not consistent in its behaviour, how can I study the question at all?"

It seems to be inevitable in experiments in this field of inquiry—if they can be called experiments—that a great deal must depend on the good faith of the medium. There is always the lurking suspicion that, consciously or unconsciously, the observers are being deluded—a factor utterly foreign to any class of physical experiment. This suspicion is traceable not so much to the fact that, in the past, trickery has been exposed in the performances of such individuals, as to the fact that results are claimed of a nature antagonistic to the tacit philosophy of the physicist. To meet this difficulty, one of the first tests that ought to be performed should be to determine the precise conditions under which a medium can be dispensed with. Quite obviously, the smaller the number of persons actually essential to an experiment, the greater the confidence in the result. Is it not possible for the National Laboratory of Psychical Research to produce the details of a single and convincing experiment that could be performed by any competent scientific worker in his own laboratory, as simple, say, as measuring the period of a pendulum? If 'levitations' are as frequent as they are claimed, this should not be impossible. The writer has frequently tried such experiments alone, but always in vain. What are the conditions that will ensure success? Surely, after so many years' experimentation by devotees of the cult, including many eminent men, this must be known very accurately. All the tests described in the publication under review are so complex that instead of carrying conviction they arouse suspicion. It is the simple test that is required.

There is, however, another—and possibly more important—factor that repels the scientist: it is the implications and assumptions inherent in the descriptions of these uncanny doings. If a voice is heard speaking from a box, is it necessary to assume it has an owner, 'Walter'? In a court of law it might be a legitimate assumption to make, and it might in conceivable circumstances be sufficient to hang a man, but in the description of a scientific experiment, why imply the existence of an 'owner' to the voice and by identifying it with 'Walter'? Even assuming the accuracy of the phenomenon, which in the circumstances one would be far from doing, there are numerous possible working hypotheses of a more normal type than that of 'spirits.' When Sir Richard Paget makes his hands speak, one does not assume that the voice belongs to a spirit, even if it does call itself 'Walter.' Men of science have learnt that words are treacherous things, that false ideas of an ignorant past are dragged in at each turn, so they have learned to talk in symbols, with a clear-cut (1, 1) correspondence between idea and symbol. But the language of supernormal behaviour—and the very phrase itself is dangerous—is not yet sufficiently divorced from mystery and superstition, not yet sufficiently definite and precise, to ensure that the pet theories and vague beliefs of its devotees are not foisted on the unwary inquirer as he receives his description of the phenomena.

If the National Laboratory of Psychical Research can produce a simple laboratory experiment, capable of being performed by a careful and trained scientist under conditions that he himself can guarantee and control, it would go further towards producing the revolution in thought which the Council so earnestly desires than volumes of 'evidence' of the type given in the present issue of its Journal.

H. LEVY.

Dynamics and Ballistics.

(1) *Lezioni di meccanica razionale.* Per Tullio Levi-Cività e Ugo Amaldi. Volume secondo: *Dinamica dei sistemi con un numero finito di gradi di libertà.* Parte prima. Pp. x + 527. (Bologna: Nicola Zanichelli, 1926.) 65 lire.

(2) *New Methods in Exterior Ballistics.* By Prof. Forest Ray Moulton. Pp. vi + 258. (Chicago: University of Chicago Press; London: Cambridge University Press, 1926.) 20*s.* net.

(1) THE monumental treatise which Profs. Levi-Cività and Amaldi are engaged in writing on rational mechanics (to use the comprehensive title established on the Continent) is divided into three volumes, which deal respectively with kinematics and statics, dynamics of systems possessing a finite number of degrees of freedom, and dynamics of continuous systems. The second volume is divided into two parts, to the second of